Ministry of Transportation

TRANSPORTATION FOR DISABLED PERSONS IN ONTARIO: TOWARDS A STRATEGY FOR THE 1990's

VOLUME 1
SUMMARY REPORT

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TRANSPORTATION FOR DISABLED PERSONS IN ONTARIO: TOWARDS A STRATEGY FOR THE 1990's

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SUMMARY REPORT

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NOTE

This is Volume 1 of a study prepared by James F. Hickling Management Consultants Ltd. on behalf of the Ontario Ministry of Transportation, entitled **Transportation for Disabled Persons in Ontario: Towards a Strategy for the 1990's**. The Study is presented in four volumes:

Volume 1:	Summary Report
Volume 2:	Main Report
Volume 3:	Appendices to the Main Report
Volume 4:	Detailed Options (Appendix I)

PREFACE

This study was commissioned by the Ministry of Transportation of Ontario to provide a basis for long term policy development and strategic planning in the provision of transport services for disabled people. Although the study is intended to provide a basis for program planning and budgeting, further analysis will be required in order to implement any of the policy initiatives discussed.

Any study of this scope and nature involves assumptions, forecasts and estimates that are inevitably uncertain. Tests conducted by the study team indicate, however, that the study's fundamental strategic conclusions remain the same under a wide range of variation in the underlying assumptions. To aid in the development of detailed implementation programs, the study provides a framework within which further operational assumptions and forecasts can be tested in order to study the implications of alternative approaches.

This research would not have been possible without the help and participation of a number of individuals and organizations in Ontario, including user groups, service providers and governments. The authors are particularly grateful to the members of the Study Committee which consists of Richard Puccini, Kevin Pask, Rob Barnes, Chris Poon, Bob Boyle, Glenn Johnston, Dave Hanes, Kathy Moore, Joan Cappa, Pentti Suokas, Larry Smith, Dave Winkworth, Nino Campitelli and Hau-Chi Pang for their review and comment on the report.

The report reflects the views and conclusions of the authors and not necessarily those of the government of Ontario or the members of the Study Committee.

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MAIN REPORT

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TRANSPORTATION FOR DISABLED PERSONS IN ONTARIO: TOWARDS A STRATEGY FOR THE 1990's

SUMMARY REPORT

Isolation, loneliness, poverty and discrimination: Worldwide, policy makers have become increasingly aware of these, the traditional bonds of disability.

DISABILITY IN ONTARIO

In 1986, there were more than 1,000,000 Ontario residents, almost 14 per cent of the provincial population, with physical, sensory or mental disabilities that limited their ability to take part in the full range of life's major activities (Summary Table 1). By the year 2000, the number of disabled Ontarions will likely grow by 30 percent.

For many in Ontario, a disability can make it difficult or impossible to use ordinary means of transportation and their range of opportunities is thus narrowed because of barriers to travel. As shown in Summary Table 2, 39,000 people have functional disabilities that make it impossible for them to board buses and trains; among these, fully 27,000 live within a short walk of transit but cannot physically use it. Although some disabled persons are eligible to use provincially subsidized lift-equipped specialized transit services that take them from door-to-door, some are ineligible to use these services. And for those who may, service is limited to travel within their local municipality.

More than 130,000 Ontario residents have mild or moderate disabilities. 360,000 seniors live with the frailties and other debilitating manifestations of advancing age. For these individuals, certain vehicle design features -- such as the high first step to get on a bus or a low-slung automobile -- can diminish the number of opportunities to get out and about.

In rural Ontario with no transit service, there are an estimated 6,000 wheelchair users and more than 11,000 other severely disabled persons with very limited transportation alternatives. In many instances, they lack regular access to a car and cannot afford the high cost of regular taxi travel. Although a number have friends, relatives or volunteers to drive them, such resources are limited and many disabled people in rural areas are thus constrained in their travel opportunities.

For trips from city to city, disabled people must often rely on others to drive them. An inability to drive themselves and the failure of buses (the most ubiquitous mode of inter-city public transport) to accommodate those unable to use steps can mean relatively few trips away from home.

SUMMARY TABLE 1: POPULATION OF DISABLED PERSONS IN ONTARIO BY TYPE OF DISABILITY (1986)

CATEGORY	NUMBER OF DISABLED PERSONS (IN 000's)	PERCENT TO TOTAL ONTARIO POPULATION
Total	**1015**	**13.6**
Persons Unable to Use Stairs	86	1.1
Persons Unable To Walk 400m Without Rest And/ Or Use Stairs	187	2.5
Persons Unable To Stand For 20 minutes Walk, And/Or Use Stairs	266	3.6
Persons With Trouble Standing, Walking Or Using Stairs	348	4.6
Visually Impaired Persons	129	1.7
Hearing Impaired Persons	257	3.4
Mentally Impaired Persons	27[3]	0.4
Elderly Disabled Persons	361	4.8

Source: James F. Hickling Ltd. and Canada Health and Disability Survey of 1983, converted to 1986 populations.

Notes:
1. Some individuals are included in more than one group.
2. Excludes children.
3. Other survey estimates are significantly higher.

SUMMARY TABLE 2: NUMBER OF DISABLED PERSONS IN ONTARIO WITH SELECTED TRANSPORTATION-RELATED DISABILITIES (1986)

	NUMBER OF DISABLED PERSONS	PERCENT OF TOTAL ONTARIO POPULATION
Wheelchair Users	22,000	0.29
Persons Unable to Board Public Transportation	38,900	0.52
Persons Unable to Use Public Transportation[4]	90,300	1.2
Persons with Difficulty Using Public Transportation[5]	205,000	2.7
Mentally Impaired Persons	20,000[3]	0.27
Blind Persons	12,200	0.16

Source: James F. Hickling Ltd. and Canada Health and Disability Survey of 1983, converted to 1986 populations.

Notes:
1. Some individuals are included in more than one group.
2. Excludes children and homebound persons.
3. Use with caution. Other estimates are significantly higher.
4. Includes those unable to board public transportation.
5. Includes those unable to use public transportation.

Along with the physical disadvantages of disability come the problems of low income. Among disabled persons of working age, less than 32 percent are employed in remunerative work compared with a rate of over 60 percent among the rest of the general public. The average income among disabled persons -- an estimated $11,000 a year -- is only 60 per cent of that of the non-disabled.

Low income magnifies the transportation problems of disabled persons. As indicated above, when taxis are the only available means of transport, high fares represent a significant barrier to travel. But low income also prohibits many disabled persons from owning their own vehicle. The privately owned car is by far the most frequently used mode of transport in Ontario. As shown in Summary Table 3, less than one third of all journeys among the disabled and the public at large are made by public transport.

For many disabled persons, the use of a car is often the solution to transportation problems. In a major transportation survey conducted by the United States Department of Transportation[1], disabled persons were asked how much more they might travel if all their transportation problems were removed. Those who usually had access to a car said they would make about three percent more journeys while those without regular access to a car claimed the need to travel 30 percent more often.

Although an estimated 73 percent of all disabled persons in the province use personal vehicles today, an additional 70,000 might choose to do so if limited income did not stand in the way of auto ownership. Among the latter, some 7,000 use wheelchairs, those who rank highest among the disabled population in terms of unemployment. Transportation generally, and car ownership in particular are not in themselves the solution to joblessness and low income among wheelchair users and other disabled persons: but for some, particularly the young and physically vigorous, the use of a car is a necessary step toward greater independence and self-reliance.

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1 Urban Mass Transportation Administration, **Survey of Persons with Transportation-Related Disabilities**, 1979.

SUMMARY TABLE 3: PERCENTAGE OF TRIPS TAKEN BY DISABLED AND NON-DISABLED PERSONS, BY MODE, URBAN AREAS (1986)

MODE	DISABLED PERSONS	GENERAL POPULATION
Total Number of Trips Per Month	30	55
Percent of Total Trips		
Personal Vehicle as Driver	49	63
Personal Vehicle as Passenger	16	16
Public Transit	18	15
Taxi	8	1
Specialized Service	1	--
Walking	7	5

Source: James F. Hickling LTD. from the Canadian Health and Disability Survey and the U.S. Urban Mass Transportation Administration.

Note: 1. Excludes children and the homebound.

PROVINCIAL POLICY: THE FIRST DECADE

For more than a decade, the province of Ontario has been developing policies and programs to help disabled residents gain independence, financial security and self-respect for themselves and their families. In 1979, the Ministry of Transportation and Communications (MTC) implemented a program of financial support for municipally administered specialized transportation systems -- small vehicles equipped with lifts for wheelchairs, that provide transportation to disabled persons who cannot board fixed-route transit systems. In 1986, the provincial government spent $14 million in capital and operating subsidies to help pay for these services.

Since the advent of that program, however, there has been no comprehensive review of the policy or of the transportation problems of disabled persons in Ontario. The MTC commissioned this study as a result. The study represents a comprehensive examination of transportation and disability in the province and provides the strategic basis needed for the development of provincial transportation policies and programs in the decade ahead.

In making policy and planning programs over the last ten years, decision makers in Ontario and their technical advisors have had to deal with a number of important philosophical and analytic issues. An understanding of these questions is critical as the province begins to shape policies for the decade ahead. A review and analysis of the issues is summarized next.

Philosophical Issues

People rarely travel just for the sake of it. They need to move around for a variety of purposes such as earning money, visiting friends, going to school and getting to the doctor. These objectives can be obtained only at a price, which includes the cost of time, of physical effort and of convenience, as well as the direct money costs. All of these cost can be changed by policy decisions.

For individuals with physical and other disabilities, the costs associated with physical effort can prove particularly onerous; for some, the distance to a bus stop or the need to use steps can make it impossible to use certain modes of transportation.

Like other members of the general public, people with disabilities also face time and money costs in order to travel. But compared with the public at large, disabled persons have substantially smaller incomes and the money costs of transportation--taxi fares, auto purchases and running costs and so on -- can thus represent a disproportionately important barrier to travel.

Transport and the Goal of Mainstreaming: A Conflict of Means and Ends. Economic research suggests that consumers do not treat transportation as an end in itself but rather as the means by which to gain access to other activities -- work, friends, leisure and so on. Since passage of Section 504 of the Rehabilitation Act of 1973 in the United States and promulgation of the Canadian Charter of Human Rights, however, it has become popular to extend the notion of access to transportation itself. As shown below, this is no mere semantic game; indeed, it creates the need for fundamental and practical trade-offs in the formulation of policy.

The distinction between means and ends in the demand for goods and services has been formalized by economists through the concepts of "final" and "derived" demands. Final demands are goods and services that are purchased for their own sake, such as food, washing machines and entertainment. Derived demands, on the other hand, are neither produced nor consumed for their own sake. Instead, they represent a necessary step in the production or consumption of a final demand.

The important point here is that as consumers, we view derived demands as part of the cost of acquiring a final product or service, not as a benefit to be derived from the consumption of that product or service. We thus hold our consumption of derived demands to a minimum relative to the quantity of final goods and services that we acquire. Electricity is a good example of a derived demand. Indeed, the demand for electricity is wholly dependent upon the demand for manufactured products, electrical appliances and so on, and consumers try to purchase no more electricity than they need in order to enjoy the services of such products.

Transportation is demonstrably a derived demand, its use hinging upon consumers' needs and desires to take part in activities away from home (or from wherever else we might happen to be). Predictably, therefore, economic studies have demonstrated that consumers generally attempt to minimize the time, inconvenience, physical effort and money costs of travel in choosing their mode of transportation.[2] As a result, the automobile has become the dominant mode of travel, now accounting for some 80 percent of all personal trip making. Moreover, the emergence of the automobile has spurred suburbanization and increasingly diverse travel patterns, thereby further enhancing the car's relative appeal. It is significant here that taxis, another form of door-to-door transportation, earn more revenue in North America than all other forms of public transit combined.

If disabled persons, like other members of the general public, are more likely to use door-to-door transportation than fixed-route service offered by buses and trains (because they find the former speedier and more convenient) then it follows that policies promoting door-to-door services would allow more disabled persons to take part in mainstream activities[3]. This has been the basic premise underlying provincial policy for the last eight years. Since 1979, the Ministry of Transportation and Communications has helped finance municipally administered, specialized door-to-door public transportation systems for persons unable to board regular fixed-route transit.

However, some disabled persons argue that specialized services alone are discriminatory and that human rights legislation protects them against such discrimination by guaranteeing their right to use the same provincially financed public services available to everyone else. This treatment of transportation as an end in itself entails the technological adaptation of bus, and rail systems so that wheelchair users, and others for whom existing stations and vehicles are

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2 Consumers do however attach different "weights", or priorities, to time, effort, money and inconvenience for different types of trips. Thus travel time will be more important for work trips than for other trip purposes.

3 Minor upgrades to public transit--for the ambulatory disabled--are also promising policies.

inaccessible, can use provincially financed regular fixed-route systems. Conflicts emerge if such investments yield fewer benefits in the form of additional travel as compared with the door-to-door approach.

The Integrated System Concept: A Conflict of Philosophy and Resources. Since both specialized and adapted fixed-route services for disabled persons are very costly, the pursuit of one approach almost certainly reduces the financial means available to pursue the other. One emerging response to this resource consideration involves the concept of an "integrated system" whereby both accessible fixed-route and door-to-door transportation services are financed through provincial policy, but not to the full extent possible in a situation where resources are fully devoted to one or the other. One potential approach entails restricting door-to-door service vehicles to the provision of rides to transit stops and stations which in turn are adapted for the use of wheelchairs.

A key policy issue in the consideration of combined services is whether restrictions in eligibility door-to-door service would leave disabled persons who are unable or unwilling to use fixed-route services without any form of low-cost public transportation. Also, whether such restrictions in eligibility are justified by the added "equity" of partially accessible public transit.

As well, the shifting of provincial policy toward the integrated approach would almost certainly require a decision to continue the existing focus on urban public transportation generally as the principal means of addressing the travel problems of disabled persons. It is less likely, for example, that sufficient funds would also be available to make substantial inroads on the problems of disabled persons living in rural areas (areas without regular public transit service) or to assist disabled persons in the purchase of specially adapted private automobiles. Since the automobile represents the main mode of travel in Ontario -- particularly in rural areas -- the tradeoffs inherent in the "integrated" approach need to be very carefully considered.

The Question of Equal Service. Some disabled persons argue that separate, specialized services are permissable, but only if they offer a standard of convenience "equal" to that of public transit. The policy problem here lies in the fact that equality is open to such broad interpretation. Some maintain that door-to-door, specialized services must be designed to account for the fact that public transit users need no more time to decide to travel than the average time between buses. Under this logic, for example, the common practice in Ontario of requiring day-ahead booking for door-to-door service would be regarded as unacceptable. As well, days and hours of service, geographic range and trip purposes served by specialized service would need to equate to that of regular transit.

Transport analysis suggests otherwise, however. Research[4] finds, for example, that from the viewpoint of the disabled consumer, the 24 hour advance booking requirement for many trip purposes represents an acceptable "price" for the extra convenience of door-to-door service. Ultimately, however, such questions raise important value judgments and final decisions must be a matter of policy.

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[4] See, David Lewis, **The Economics of Transportation for Disabled Persons**, London School of Economics, 1985.

Principal Analytic Issues

To be useful, policy analysis must offer the decision-maker a practical range of relevant alternatives and a reasonably accurate picture of their likely impacts on policy objectives. The application of analytic techniques to the evaluation of transport policy for the disabled raises a number of special forecasting and evaluation issues by virtue of the unique problems facing disabled persons and the broad array of objectives that public policy seeks to achieve on their behalf. The key analytic problems may be classified as follows:

- o Identification of Objectives;
- o Identification of Alternatives;
- o Determination of Service Standards;
- o Identification of Target Groups;
- o Demand Forecasting;
- o Identification and Forecasting of Costs; and
- o Comparison of the Alternatives.

Identification of Objectives. A number of policy analyses rest on the premise that human rights legislation prohibits discrimination against disabled persons in the provision of public transportation services and extend this premise to the presumption that anything short of access to existing, fixed-route bus and rail systems constitutes a violation of these rights. Other studies assume that the law demands equal benefit in the provision of public services and that the means of conveying such benefits are open to choice.

A wider view of objectives than either of the two common approaches listed above is to view transport as a "merit" good, mobility, a minimum level of which is to be supplied to all irrespective of their physical ability or their ability to pay. Despite the appeal of this approach, however, it raises difficult definitional problems. It is exceedingly difficult, for example, to establish objectively, analytically or even subjectively what the minimum level of mobility "ought" to be[5]. Although the wealthy travel more than the poor it is obviously not the aim of public policy to establish equality among income groups. To a large extent, differential travel rates between disabled and non-disabled persons reflect income differentials and it would thus be implausible to treat the travel rates of non-disabled persons as an objective for disabled persons.

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[5] Education is an example of a merit good where the minimum "acceptable" level has been defined, namely a high school qualification.

Some analysts attempt to apply the analytic concept of "travel need" in order to establish policy objectives. In practice however this notion is of little practical value. For unless an individual is going without food or basic medical care because of inadequate transport, it is impossible to distinguish "needs" from "wants" without making significant value judgments.

In parallel with provincial practice, this report takes a practical benefit-cost approach to the problem. Various possible service improvements are listed on the basis of a careful review of the existing availability and distribution of transportation for disabled persons. Using forecasting techniques discussed below, the options are then compared in terms of their prospective impact on the range of objectives that are of key importance to decision makers. These objectives include the amount of additional travel likely to result from a given approach and the number of disabled persons served. Since greater travel is coincident with greater access to mainstream activities, the analysis searches for policy approaches that promote the greatest relative increase in travel frequency.

Intangible objectives, such as that of promoting equity and dignity in the distribution of service quality, are also addressed in the benefit-cost approach. However, if cases arise in which one policy option promotes relatively more travel than another, but is judged by some individuals to offer a poorer standard of dignity, the ultimate policy trade-off must rest with elected officials; the analysis itself cannot resolve conflicts that are inherently subjective.

Identification of Alternatives. A broad view of objectives means that the analysis should search as broadly as possible for alternative policy approaches. The search should occur against a background of stated policy objectives and an analysis of existing transportation problems. Having identified shortcomings in the existing distribution and availability of transportation for disabled persons in Ontario, therefore, this study searches for solutions among five generic classes of possible policy responses, as follows:

- Financial assistance and training in the acquisition and use of private automobiles;
- Provision of cash transfers ("mobility allowances") to disabled persons for use as they see fit;
- Provision of block grants to local levels of government for their allocation to transportation improvements ; and,
- Provision of paratransit services, including voluntary services, user-side subsidies, publicly and privately operated specialized services and other public and quasi-public transport alternatives that do not operate over fixed-routes;
- Adaptations to fixed-route transit services to make them accessible to those now unable to use these services.

Although there are a great many variants, combinations and ancillary options among the five classes, four key policy choices are inherent in choosing among them.

First, the options reflect a choice between public and personal modes of transportation. In Ontario, and in North America generally, policy in the last decade has focused almost exclusively upon public transportation. Mobility, however, is determined by many modes of transport, especially the ubiquitous automobile which accounts for more than two-thirds of total trip-making among disabled and non-disabled persons alike. This study thus recognizes all modes of transport in the search for appropriate and effective policy options.

Second, the options reflect a choice between the public sector and the private sector in the provision of public transportation. Over the last 20 years, the private sector has become increasingly involved in formal arrangements with local transit authorities, municipalities, and social service agencies in the delivery of transport for disabled persons. Recent studies in the United States[6] conclude that most services provided for disabled and elderly persons in that country involve the private sector in one form or another. Public-private partnerships are also growing in Canada, though at a lesser rate.

A fundamental assumption in the choice to form public-private partnerships is that private services are cheaper, more efficient and more effective than public delivery of the same services. The research cited above has concluded, however, that a number of communities have so constrained the private provider's operations or so limited the overall competitive market (by tendering service contracts to a single carrier, for example) that they reduce or even remove the inherent efficiencies of the private market. The way in which public-private partnerships are formed is thus critical to their success.

A third area of choice involves decisions about the provincial role in deciding how transportation dollars ought to be spent. Should the province earmark budget dollars for specific types of service, or should provincial dollars be made available to others (such as lower administrative units or individuals) for them to allocate as they see fit?

For example, this study finds that although a wide array of transportation is already available in rural areas, including private cars, taxis, organized groups of volunteers and informal volunteerism (often amounting to basic neighborliness and the dispatching of family responsibility), these resources are not sufficient to maximize the mobility and freedom of rural disabled residents. While this suggests that an expansion of such services with the help of provincial resources might be in order, policy makers must decide whether it is the provincial government, lower levels of authority, disabled people themselves or some mix of these groups that are the most effective and appropriate to decide exactly how the additional provincial dollars should be spent.

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6 See, Sandra Rosenbloom, The Role of the Private Sector in the Delivery of Transportation Services to the Elderly And Handicapped in the United States, Paper presented to the 1987 Annual Meetings of the Transportation Research Board, National Academy of Sciences, January 15, 1987

A fourth factor involves the choice between making fixed-route services accessible and providing specialized service. Although the two are not mutually exclusive, the high cost of each means that an emphasis on one will almost undoubtedly force diminished emphasis upon the other.

Although the fixed-route specialized service trade-off is at first glance an urban issue, it can have an important bearing on transport for disabled persons in rural areas as well. This is because the high cost of making rail and other fixed-route facilities accessible to those who cannot use steps can absorb budget dollars that might otherwise be available for rural areas. As well, the use of specialized services in urban areas creates the possibility of extending their coverage into adjacent rural areas as well; fixed-route services are far less flexible in this respect. The choice of fixed-route and specialized service must thus be viewed within the context of provincial policy and budgets generally rather than an urban issue per se.

A large body of research[7] indicates that specialized service results in more travel than accessible fixed-route service, even in urban areas where fixed-route accessibility has been relatively successful. One reason for this is that some severely disabled persons are unable to get to bus stops and stations, making the door-to-door alternative more useful. The more fundamental reason, however, reflects consumer preference. Like other members of the general public, disabled persons tend to choose the convenience and comfort of door-to-door transport over fixed-route public transportation. Actual experience indicates that the most common reasons given by wheelchair users for not using accessible fixed-route services are the availability of an automobile, (either as driver or passenger); and the inconvenience of multiple transfers.

These research findings create a conflict for policy makers. Accessible transit, even in the context of human rights, does not promote the greatest access to mainstream activities. The cost of access can also diminish the availability of budgetary resources for use in solving rural and inter-city mobility problems. While policy analysis can expose the costs and benefits of the various trade-offs, ultimately it is elected representatives that must decide how best to proceed.

Determination of Service Standards. In designing specific options, it is necessary to establish policy regarding the level and quality of service to be supplied. What proportion of a bus fleet should be equipped with lifts? How many hours should individuals have to wait before obtaining specialized service? What fare should a disabled passenger have to pay for alternative public transportation?

The general approach adopted in this study is to establish service levels through the use of "comparable service" criteria. Under this approach, fleet accessibility, fares, trip purpose restrictions and other service attributes are established with reference to the standard established by fixed-route services available to the general public. Where options depart from this general standard, the rationale for the departure is stated together with its implications for benefits and costs.

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[7] For a wide ranging review of the literature see, National Cooperative Highway Research Program, Transportation for Disabled Persons: A Planning Guide, 1983.

Identification of Target Groups and Eligibility Standards. It is well established in academic and applied research that disabled persons, like other members of the general public, represent a highly diverse, heterogeneous population with a wide range of functional abilities and disabilities. It follows therefore that transport policies must also be diverse and sensitive to the different preferences and requirements of people with different functional problems. The analytic challenge here is to gain a sound and thorough understanding of the demographic and socio-economic characteristics of the transportation disabled population and to develop a workable functional classification system as a basis for guiding the formulation of transport policy.

In addition to the analytic issues associated with identifying the demographic and socio-economic characteristics of the disabled population, one of the most difficult policy problems involves the determination of eligibility standards for specialized services. The issues are different, moreover, in urban and in rural areas.

Since its inception, Ontario's provincial program of subsidies for municipal specialized services have been limited to persons "unable to board" fixed-route services. Although research[8] concludes that some municipalities extend eligibility to disabled persons who cannot use fixed-route transit for other reasons, such as an inability to walk a short distance to a bus stop or, in some cases, to blind and mentally disabled persons as well, this study finds that the "inability to board" rule leads a number of cities to exclude those for whom existing fixed-route service is impossible to use.

The principal issues here are cost, service quality and program control. Research conducted in the United States[9] demonstrates that eligibility policy is the most important factor in determining the total cost of operating a specialized service. Moreover, in cities that extend eligibility to a broadly defined group of disabled persons, service quality often suffers since limited resources must be spread among more people.

The issue of program control emerges as a key factor for Ontario in the consideration of eligibility policy. The issue is essentially the practical question of distinguishing one individual from another in making eligibility decisions. The research finds, for example, that among legally blind persons, about one-quarter cannot use existing fixed-route services and would benefit from specialized service. A similar proportion of mentally disabled persons appear to be in a similar position. However, if the Ontario eligibility policy was to be extended to include such persons, local eligibility committees would need to develop the means to decide who among the blind and mentally disabled population should and should not be eligible to receive service.

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8 James F. Hickling Management Consultants Ltd., Eligibility for Specialized Transportation in Ontario, June 1986.

9 David Lewis, Special Purpose Passenger Transport: The Economics of Serving the Travel Needs of Handicapped Persons, London School of Economics, 1985.

Such distinctions are extremely difficult to make in a consistent and objective manner, even with the help of medical experts[10]. In cities where such attempts have been made, the result has typically been the admission of all blind and mentally disabled persons, no compensating budgetary increase and a reduction in service quality.

A review of experience indicates that eligibility committees are typically more liberal than their official guidelines: as discussed above, a number of Ontario municipalities extend eligibility beyond the official provincial guidelines on an exception basis; the policy question is whether to rely on this informal process to serve currently ineligible persons -- a relatively low risk approach from a budget and service quality point of view -- or whether to extend the official eligibility guidelines, an approach that exposes specialized service budgets to substantial risk.

Eligibility issues also arise in the consideration of rural policy. Although eligibility policy for urban specialized services is set in relation to individuals' ability to use regular fixed-route transit, the same standard may be viewed as incongruous in areas without fixed-route transit service. Unfortunately, there is no objective answer to this conundrum from a policy point of view. One approach is to view rural policy as essentially a process of facilitating equal benefit under provincial programs for rural and urban disabled persons. Under this approach, a rural eligibility standard keyed to that applying in urban areas would be appropriate.

If the urban standard were not considered appropriate (because, for example, rural and urban services are not equalized generally as a matter of policy), the choice of an eligibility standard becomes essentially arbitrary. One approach would be to single out the poor disabled since inability to pay high auto and taxi costs represents a key rural problem. This policy could be viewed as inequitable, however, since non-rural disabled persons receive provincial transport benefits without a means test. An alternative would be to focus rural eligibility on those unable to walk -- that is, those for whom existing services are particularly difficult.

This study adopts the "urban standard" as the approach that appears to most closely reflect provincial objectives for improving the availability and distribution of transport for disabled persons in the province. It is recognized, however, other approaches may be debated and the study presents their costs and benefits as well.

Demand Forecasting. Much of the published work in the area of transport for disabled persons draws on the concept of "latent demand" or travel "needs". These are defined, implicitly, as the amount of travel that would be undertaken at zero fare to the consumer or as the difference between the travel rates of disabled and non-disabled people. The only means of obtaining estimates of latent demand under the first definition is by posing hypothetical questions of survey respondents-- "how much would you travel if" -- questions that inevitably lead to exaggerated claims -- a wish list of trips to be made regardless of cost and inconvenience.

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[10] ibid.

In reality, the use of a given service will hinge on its cost, comfort, convenience and degree of physical effort required. Failure to recognize this in a number of studies has led to misinterpretation of existing travel patterns. For example, the low use of lift-equipped buses in many cities around North America has been attributed to unreliable lifts and inadequate capacity. While these are no doubt contributing factors, recent surveys indicate that consumer preference is usually a more important contributory factor. In particular, the availability of a private car or a door-to-door mode of public transportation is cited by most disabled persons who do not use lift-equipped buses as their principal reason for not doing so.

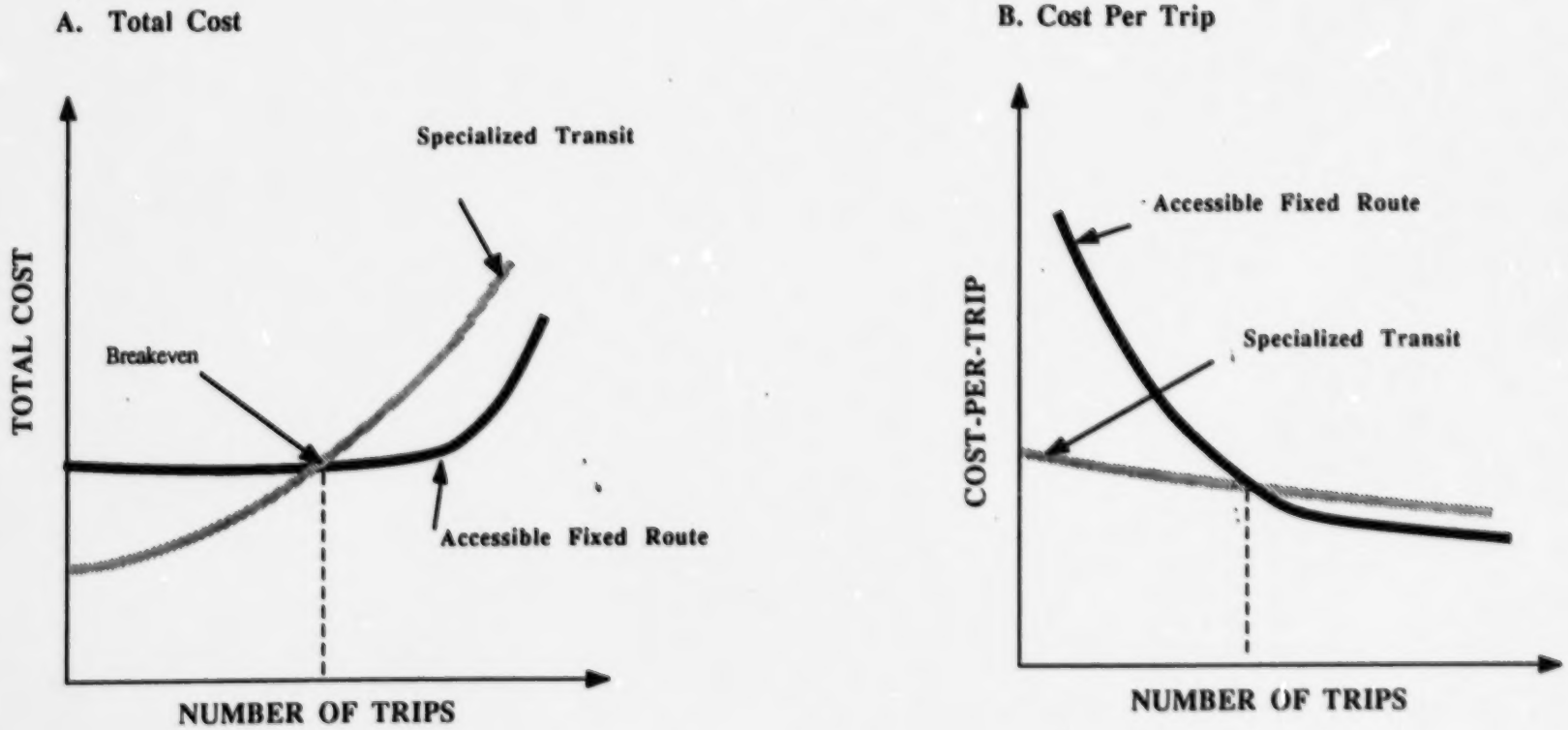
This report thus uses conventional methods of demand analysis to establish the likely use of alternative service improvements. The use of a service is assumed to be conditioned by its cost and other attributes and demand is projected on the basis of disabled people's observed response rates to such attributes.

Identification of Costs. Each approach to the travel needs of disabled persons has its unique cost characteristics. The cost of adapting public transportation facilities is broadly fixed, regardless of the use made of them by disabled persons. The cost of specialized door-to-door transportation, on the other hand, is relatively flexible; it depends heavily on the number of disabled persons who use it and on the productivity of service delivery -- e.g., trips per vehicle-hour. This means that, below a certain level of use, plans that emphasize door-to-door services will cost less than plans requiring adaptations in mass transit systems, as depicted graphically in Summary Figure 1. Cost-per-trip (a measure of efficiency) displays a similar profile. Beyond a certain level of patronage, adapted transit service would appear more cost-effective than specialized transit since cost-per-trip of adapted transit declines sharply as more people use it. Cost-per-trip of specialized transit, on the other hand, is relatively stable, regardless of patronage, (Summary Figure 1B).

Although the simplified analysis above provides a useful basis for exposition, it buries a number of critical issues. First, (as shown in Summary Figure 1) the cost of adapted transit is not insensitive to demand over the entire range of possible patronage. This is because beyond a certain level of use the high marginal boarding times associated with wheelchairs would cause delays and require the operation of extra vehicles in order to maintain scheduled headways. This, in turn, would result in increased total cost. Second, the cost and cost-per-trip of door-to-door specialized transit is not entirely insensitive to the volume and mix of patronage. If ride-sharing is high, for example, productivity (trips per vehicle-hour) will be correspondingly high and cost per trip (cost per vehicle-hour divided by trips per vehicle-hour) will thus be low. On the other hand, if specialized transit eligibility is restricted to severely disabled persons, their lower density of demand (fewer passengers per square-mile) and higher marginal boarding times could diminish productivity and result in higher cost-per-trip (see Summary Figure 1).

And, of course, specialized transit costs will hinge critically upon labour costs -- a factor that enters the accessible fixed-route transit option only to the extent that added vehicles are called for to maintain schedules or added staff-time is required to maintain lifts.

SUMMARY FIGURE 1: THEORETICAL BEHAVIOUR OF COST AND COST-PER-TRIP OF ADAPTED TRANSIT AND DOOR-TO-DOOR SPECIALIZED TRANSIT



The factors outlined above will bear heavily upon the "breakeven" demand associated with each option -- that is, the demand level at which adapted transit and specialized transit costs and cost-effectiveness are equal. As shown in Summary Figure 1, if specialized transit productivity is sufficiently low (or wage costs sufficiently high), the breakeven demand level may be quite low as well. On the other hand, if rising adapted transit costs are encountered relatively early and specialized transit productivity is high no breakeven point will exist at all--accessible fixed-route transit total cost and cost-per-trip will always exceed that of specialized transit. The analytic challenge is to quantify these cost factors in order to evaluate alternative policy approaches.

It is also important to recognize that a range of different cost concepts are germane to the policy questions under review here. For budgetary purposes, it is necessary to forecast the annual outlays likely under any given policy option. Annual outlays are not, however, an adequate basis for judging the most economic policy. This is because some options display low initial capital costs but high on-going operating expenses while others options are associated with the opposite cost profile. To compare such options on an equal footing, it is necessary to estimate the present value all future expenses over the life of the program. Both types of cost estimate are developed in this study.

Comparison of Alternatives. As discussed earlier, policy decisions must rest on a wide range of objectives. The analytic challenge here is to specify a range of evaluative criteria that properly reflect those objectives without allowing the number of criteria to expand to an unmanageable size from the viewpoint of the decision maker.

Another challenge is to provide as much quantitative detail as possible while avoiding the temptation to attach numbers to factors that inherently defy enumeration. A "planning balance sheet" approach is adopted here that presents both quantitative and qualitative detail; it is left to the decision maker to attach weightings to the various factors depending upon his own view of the priorities among various objectives.

THE DECADE AHEAD

The major findings of this policy review may be divided into conclusions regarding current provincial policy and conclusions regarding future policy directions.

The Score-Card on Current Policy

Based upon a wide-ranging review and analysis of the availability, distribution and use of transportation services for disabled persons in Ontario, this study draws two principal conclusions regarding current policy.

First, provincial objectives underlying transport for disabled persons focus exclusively on enhancing the travel opportunities of disabled persons. Transportation is regarded as a means of gaining access to other activities and not as an end in itself.

In the context of this objective, the focus of existing policy on door-to-door transportation is well conceived in light of the apparent preferences of the majority of disabled persons. The analysis presented in the body of this report indicates that, like other members of the general public, disabled persons prefer the convenience and comfort of door-to-door transportation. Specialized service has come closer to satisfying the preference for door-to-door transportation than a program of adapting fixed-route vehicles and facilities for those physically unable to use these services today.

In the provision of door-to-door specialized service, the gradual development of public-private partnerships is also well conceived from the viewpoint of improved efficiency and effectiveness.

Provincial eligibility policy, though highly constrained compared with most other specialized service systems in North America[11], also appears well conceived given the existing budgetary commitment to specialized service. By constraining eligibility to persons unable to board fixed-route transit, the current approach allows municipalities to target specialized resources to those with the greatest need. Steps to expand eligibility to those unable to get to a nearby transit stop would extend the service to a number of individuals without meaningful alternatives; as indicated below, however, a standard of eligibility that is open to too wide an interpretation could quickly lead to excessive demand at the expense of service quality.

The current policy of channeling the major share of available provincial resources to door-to-door service rather than fostering a mix of accessible fixed-route and specialized service (the so called "integrated" approach) tends to focus resources on services that maximize trip making for a given transport budget.

The subsidy of design modifications to public transit vehicles, for the ambulatory disabled, is also a well-founded policy. It serves many travellers, for comparatively low cost. However, current budgets and schedules are not fixed or mandatory. More could be done.

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[11] ibid.

The second conclusion regarding provincial policy is that despite the reasonably effective use of existing budgetary resources, scope exists for substantially improving the availability and distribution of travel opportunities for disabled residents of Ontario. In the longer run, scope also exists for improving the efficiency with which existing programs are delivered and for using the savings to improve service availability and quality.

To improve travel opportunities for disabled persons in Ontario, the existing provincial budget for disability-related transport programs -- about $14 million in 1986 -- would need to expand. Measures to improve efficiency would help mitigate budgetary growth but additional spending would nevertheless be required.

The most significant problems under current policy may be summarized as follows;

- **Personal Mobility.** In focusing almost exclusively on the provision of public transportation, current policy fails to address the preference of many disabled persons for personal transportation. Ubiquitous and important as it is in North American society, lack of access to an appropriately adapted car can sharply curtail the mobility of a disabled person.

- **Rural Transportation.** In areas without transit service, provincial policy is weak in its efforts to promote mobility for disabled persons.

- **Urban Transportation.** Current policy is weak in facilitating inter-jurisdictional mobility among disabled persons. The problem is particularly acute in the greater Toronto region where commuter services offered by GO Transit operations have virtually no equivalent service for disabled persons who cannot negotiate steps and overcome other architectural barriers. Inter-municipal specialized services are also inadequate. Current policy could also be strengthened by aligning provincial eligibility guidelines for specialized service subsidies more closely with the needs of individuals who cannot use existing fixed-route services. As well, there is considerable scope in the medium to longer term to promote efficiency through further public-private partnerships in the provision of specialized transportation. Finally, minor fixed-route transit design failings inhibit travel opportunities for those mildly and moderately disabled persons for whom buses and trains are difficult and inconvenient to use.

This review also examined the intercity transportation problems of disabled persons and a number of issues are identified below along with options for a provincial role.

Future Directions: A Comprehensive Strategy for the 1990's

Given the broad array of objectives, needs and opportunities outlined above, no single initiative can be expected to respond to them all. Based upon the review and analysis of a wide array of possible responses to the problems that exist under current policy, Summary Table 4 presents the costs and benefits of those initiatives that form a regionally balanced, effective and economic basis for guiding provincial planning over the decade ahead.

As a basis for strategic planning, the initiatives outlined in Summary Table 4 do not require immediate or simultaneous implementation. Nor do they require implementation in precisely the form indicated in the Table. Indeed, for each initiative there exist many possible variants, each with higher or lower costs and benefits than those shown, depending upon their relative scope. It is this flexibility that characterizes the Summary Table as a basis for long-term strategic policy rather than a prescriptive basis for immediate change. Using the strategy as a guide, policy planners and decision makers should be able to forge specific plans and budgets for the phasing and scope of individual initiatives.

The strategy is aimed at maximizing mobility for those disabled persons with the greatest transport problems for any given endowment of budgetary resources (an approach sometimes known as "optimization"). For this reason, the strategy places relatively little emphasis on large scale investments in making fixed-route transit systems accessible to wheelchair users and others unable to use steps. The analysis finds that such investments tend to draw very heavily on resources while resulting in relatively little additional trip making.

SUMMARY TABLE 4: PRINCIPAL ELEMENTS OF A STRATEGIC TRANSPORTATION POLICY FOR DISABLED PERSONS IN ONTARIO

INITIATIVES	GENERAL NATURE OF PROGRAM
CURRENT POLICY	Operating and capital assistance to municipalities in the provision of specialized transit.
PERSONAL MOBILITY	
Enhanced Training	Added funds for disabled driver training centres; mobile training unit for remote communities.
Subsidy for Adaptive Auto Equipment	90 percent first-time and 50 percent subsequent subsidy to wheelchair users.
Subsidy for Auto Purchase or Lease	90 percent first-time and 50 percent subsequent subsidy for wheelchair users who drive.
RURAL TRANSPORTATION	
Block Grants	Block grants to small or rural municipalities for allocation according to locally developed, provincially approved Local Transportation Plans (LTP's).
Accessible Vehicle Subsidies	50% subsidy to operators for purchase of accessible vehicles.
URBAN TRANSPORT	
Municipal Specialized Service	
Expand Eligibility and Audit	Expand eligibility to persons unable to access bus stops.
Accessible Taxi Subsidies	50 percent subsidy to taxi operators for accessible vehicle purchase.
Private Sector Paratransit (Taxis)	Expanded private-public partnerships in provision of paratransit: use of taxis user-side subsidies.
Cross-Boundary Service Enhancements	Funds and planning grants to facilitate cross-boundary specialized transit without transfer.
Public Transit	
Added Training (Blind & Mentally Disabled Persons)	Added funds for training in the use of public transit.
Design Improvements for Ambulatory Passengers	Small scale design and operational improvements, for ambulatory passengers.
INTER-REGIONAL SERVICE	
Specialized Inter-Jurisdictional Service	Public-private partnership in provision of specialized inter-regional door-to-door transportation in GO Transit service area.
Design Improvements for Ambulatory Passengers	Small scale design and operational improvements for ambulatory passengers.
Research and Demonstration for On-Call Accessible Bus Service	Demand-activated buses for long-distance recurring commuter trips.
INTERCITY SERVICES	
Accessible Intercity Buses	Provincial financial incentives to coach operators to equip buses with wheelchair lifts.
Design Improvements for Ambulatory Passengers	Small scale design and operational improvements for ambulatory passengers.

SUMMARY TABLE 4 (con't)

INITIATIVE	Number of Persons Potentially Benefiting (1986)	Percentage of Disabled Population Served	Number of Trips (1986) (000's of trips/year)	Total Cost (Present Value over 30 years) [5] ($millions)	Average Annual Budgetary Outlays (1986) ($M/annum)		Annual Budgetary Outlays (1996) [7] ($M/annum)		Cost Per Trip (1986) ($/trip) [5]
					Total [5]	Province	Total [5]	Province	
CURRENT POLICY	53,000 [1]	5.2	1,800	270	26	14	51	27	14.50
PERSONAL MOBILITY									
Enhanced Training	12,000	1.2	1,900	8	0.8 [6]	0.8	1.6	1.6	0.42
Subsidy for Adaptive Auto Equipment	15,000	1.5	2,400	57	8.0	8.0	8.7	8.7	3.30
Subsidy for Auto Purchase or Lease	12,000	1.2	1,900	134	19	19	21	21	10.0
RURAL TRANSPORTATION									
Block Grants	26,000	2.6	820	62	6.0	3.3	12	6.5	7.30
Accessible Vehicle Subsidies	1,400	0.1	40	3	0.3	0.3	0.6	0.6	7.50
URBAN TRANSPORT									
Municipal Specialized Service									
Expand Eligibility and Audit	77,000 [3]	7.6	2,400	310	30	16	59	31	12.50
Accessible Taxi Subsidies	5,000 [4]	0.5	140	2	0.2	0.2	0.4	0.4	1.40
Private Sector Paratransit (Taxis)	19,000	1.8	610	(50) [2]	(4.8)	(2.7)	(9.5)	(5.1)	(6.40)
Cross-Boundary Service Enhancements	77,000 [3]	7.6	195	29	2.8	1.5	5.5	2.9	14.40
Public Transit									
Added Training (Blind & Mentally Disabled Persons)	20,000	2.0	3,000	2	0.2	0.2	0.4	0.4	0.07
Design Improvements for Ambulatory Passengers	134,000	13.2	20,400	26	2.5	2.3	4.9	4.5	0.12
INTER-REGIONAL SERVICE									
Specialized Inter-Jurisdictional Service	29,000	2.8	157	39	3.8	2.5	7.4	4.8	24.0
Design Improvements for Ambulatory Passengers	59,000	5.8	1,800	1	0.1	0.1	0.2	0.2	0.06
Research and Demonstration for On-Call Accessible Bus Service	4,000	0.4	12	7	0.6	0.6	1.2	1.2	54
INTERCITY SERVICES									
Accessible Intercity Buses	4,400	0.4	33	13	1.3	0.8	2.5	1.6	39
Design Improvements for Ambulatory Passengers	16,000	1.6	240	1	0.1	—	0.2	—	0.40

1) Number of Registrants.
2) Brackets denote cost savings.
3) Includes those registered currently.
4) Assumes that only additional registrants (from expanded eligibiltiy) benefit from taxis.
5) Excludes cost to user (i.e. fare).
6) Over-and-above that spent by training centres and trainees already.
7) From 1986 figures using a factor of 1.96 (projects 20% increase in target population and assumes 5% inflation per year).

The strategy does, however, see the need for research into a possible role for limited lift-equipped service in the provision of long-distance, line-haul bus transportation, the area in which fixed-route accessible service has the greatest potential effectiveness and efficiency. As well, the strategy includes provision for limited modifications to all existing fixed-route transit infrastructure to make it more effective and efficient for mildly and moderately disabled persons to use. These are individuals who can already use the fixed-route systems but find doing so relatively difficult due to design shortcomings.

The approach displayed in Summary Table 4 contains five principal components, mirroring the problems under current policy discussed earlier. In selecting initiatives for inclusion under each component, the full range of possible approaches was explored. The final selection reflects the optimization objective outlined above.

The five components correspond to the major problem areas under current policy but they do not stand as independent planning elements. Indeed, while each contains the basis for initiatives that serve a particular sector, a number of the initiatives benefit other sectors as well. The accelerated development of cross-boundary specialized transit in small municipalities, for example, would benefit residents of such areas' rural hinterland as well. The discussion below summarizes the strategy for each component in turn. The final section discusses implementation issues.

Personal Mobility. A wide range of alternatives exist for improving the personal mobility of disabled individuals, but all revolve in one way or another around improving access to private cars. As shown in Summary Table 4, a program of subsidized acquisition of adaptive equipment (hand controls and other accessibility features) would require a provincial budgetary commitment of an estimated $8 million annually and would benefit about 15,000 individuals living in both urban and rural areas. Extended to both disabled drivers and households of disabled persons, the program would improve the personal mobility and safety of these disabled persons.

A program of assistance to wheelchair users for the lease or purchase of automobiles would cost substantially more -- an estimated $19 million annually in provincial resources if a high share of the cost of the car (90 percent in this example) were covered and if only drivers were to be eligible. More than 12,000 urban and rural severely disabled Ontario residents would benefit from the program, many of whom do not drive today because of the prohibitive cost of lease or purchase.

A number of methods could be employed to implement this program, including cost-reducing schemes such as the provision of a loan component to discourage frivolous demand and encourage recipients to use the car to find and engage in productive work. This is the basis of Britain's highly successful "Motability" program. Alternatively, the share of total cost to be covered by provincial subsidy could be reduced, again to preserve incentives and to hold down provincial expenditures.

Rural Transportation. As indicated earlier, the analysis presented in the body of this report finds a wide array of transport available to disabled persons in rural areas, including autos, volunteer services and taxis. The principal problem appears to be insufficient supply. Rather than target particular services for provincial attention, however, the strategy presented here draws on the mechanism of provincial block grants. Under this approach, the provincial government would make grants of about $3 million annually to small municipalities and rural authorities for subsequent allocation to various transportation initiatives, such as volunteer programs, service clubs, the establishment of taxi-oriented user-side subsidies, the acquisition of accessible vehicles or for other transportation approaches, at the discretion of the municipality.

The rationale behind this approach is that existing rural transport for disabled persons varies greatly among localities; moreover, each locality displays a diversified web of individual and group efforts, efforts of local service organizations and of commercial operators that are organized in a wide variety of different ways. Only the localities themselves are fully aware of these arrangements and are thus in the best position to allocate augmented funds effectively.

Accountability for the effectiveness of provincial expenditures would nevertheless require an element of provincial control. This could be achieved through the creation of rural transportation advisory boards, organized for the purpose of advising rural authorities in drawing up Local Transportation Plans (LTP's) for provincial approval prior to receiving the funds. The establishment of such boards would be consistent with recommendations of the Ontario Advisory Council on Senior Citizens and the Ontario Advisory Council on the Physically Disabled. LTP's would be up-dated and re-submitted annually.

It should also be noted that initiatives discussed earlier involving the private automobile would be of relatively greater benefit to residents of rural areas that are not served by regular or specialized transit service.

Urban Transportation. The strategy for urban areas focuses on improvements in the effectiveness and efficiency of existing specialized transportation systems; the strategy also includes modifications to fixed-route transit as a means of improving its effectiveness for ambulatory disabled persons.

The strategy outlined here does not, however, include the adaptation of fixed-route systems to make them accessible to those unable to use steps -- an approach often called full accessibility. In the case of municipal bus systems, full access was found to offer less mobility than the existing specialized service approach. In very small bus systems, equipping the vehicles with lifts can cost less than the operation of a specialized service. At the same time, however, the likely draw on provincial and municipal budgets would likely claim resources that would otherwise flow to specialized service, thereby diminishing the quality of the more effective option. As shown below, the strategy calls for enhanced eligibility for specialized service, a step that requires additional resources. It would not be possible to adopt a strategy of full access as well without putting the more effective option at risk.

Full access with regard to the Toronto Transit Commission's subway system was explored and found to offer the prospect of very little mobility at very high cost. Although the marginal cost of making stations accessible in the construction of a new subway system is only about one percent of total cost, all existing key stations (about half the stations in the TCC system) would need to be re-fitted with elevators and other modifications at an estimated cost of $180 million. Moreover, if the use of these stations by disabled persons were to mirror the use of U.S. accessible systems the cost per trip could be as high as $8,000.

What about a gradual strategy of full access, making only new stations and buses accessible? This study concludes that in relation to provincial objectives for mobility, economy and efficiency this approach would, in many instances, defer resources from their most effective and efficient use. In particular, while the marginal cost of making new facilities accessible is relatively low, additional resources would have to be deployed to make key portions of existing systems accessible as well -- otherwise the network as a whole would not be useful to disabled persons. This in turn would create the high additional costs outlined above and dampen the availability of budget dollars for programs that promise greater mobility.

On the other hand, where wholly new and self-contained accessible networks are considered, the low marginal cost of full accessibility would not necessarily be prohibitive. If full access were to limit door-to-door service, however, the travel opportunities of many severely disabled persons would be constrained. These cases, however, will need to be considered on their individual merits.

Under the strategy presented here, improvements in the effectiveness of specialized, door-to-door systems in municipal areas would be brought about through a somewhat broader provincial eligibility standard and the accelerated development of cross-boundary transportation.

The analysis indicates that the number of disabled persons who require specialized service -- about 61,000 persons who cannot board or gain independent access to transit stops -- is substantially greater than the 27,000 who qualify under the existing "unable to board" eligibility guidelines. On the other hand, the analysis also finds that municipalities actually extend eligibility well beyond the strict interpretation of municipal guidelines. More than 53,000 disabled persons are registered to use municipal specialized services (1986), only about 20 per cent fewer than the estimated 61,000 enumerated above. The strategy thus makes allowance for a revision to the provincial eligibility guidelines without risking an unmanageable increase in demand and cost. The strategy also calls for an eligibility audit system to ensure that municipalities do not use provincial funds to subsidize trips by ineligible individuals.

The analysis also finds that about one-third of all legally blind persons and as many as 45 per cent of mentally disabled persons have difficulty using regular fixed-route transit and could thus benefit from specialized transit. A number of these individuals have physical disabilities that already qualify them for specialized transit; moreover, many municipalities accept those with the greatest problems even in cases where they do not strictly qualify under existing provincial guidelines. It appears however that some mentally disabled and blind persons who cannot use fixed-route transit are not eligible at present.

The strategic issue is whether to extend the official provincial eligibility guidelines to include mentally disabled and blind persons who have difficulty using fixed-route transit. The strategy outlined in Summary Table 4 rests on the premise that such an extension ought not be implemented due to the sizeable budgetary risks and risks to service quality that such an extension would entail. The reason for these risks is that it is extremely difficult, and often impossible, to distinguish objectively among mentally disabled and blind persons on the basis of functional ability. Extended eligibility is thus very likely to result in virtually all such persons obtaining registration rights for specialized service, including those who can, with training, use existing fixed-route transit. Under such circumstances, the specialized transit budget would either have to expand substantially, or service quality would need to be sharply reduced as existing vehicles are used to serve a considerably greater number of persons.

It is noteworthy that with even limited expanded eligibility, the average cost-per-trip of specialized services in Ontario could be expected to decline by about 15 percent (see Summary Table 4). This means that the additional cost to the province of expanding program eligibility is likely to be less than proportional to the increase in the number of eligible users. Cost-per-trip can be expected to decline because newly eligible persons have disabilities that enable them, on average, to get in and out of vehicles more quickly than existing passengers, many of who use a wheelchair and thus require additional boarding time. With faster average boardings, system productivity (trips per vehicle-hour) would increase and cost-per-trip would thus decline (cost-per-trip being simply cost per vehicle-hour divided by trips per vehicle-hour).

The remaining strategic question is how to approach the problems of mentally disabled and blind persons who are ineligible for specialized transit. The plan outlined in Summary Table 4 provides additional funds for training these individuals in the use of fixed-route transit. This approach, together with the fact that those with the most serious problems are being admitted to the system anyway, would allocate resources to these individuals with due regard for effectiveness and efficiency.

A number of municipalities already serve cross-boundary demand. Improvements in cross-boundary travel would stem from enhanced provincial resources for this activity. The cross-boundary problem is particularly acute in the Toronto metropolitan region; under the strategy presented here, these demands would be served through door-to-door initiatives in the GO Transit service region, as outlined later.

Measures designed to improve municipal specialized transit's efficiency would also lead to greater cross-boundary effectiveness. By creating the incentives to encourage more public-private partnerships in the provision of specialized transit, unit operating costs for specialized transit overall would decline. This is because the taxi industry operates with lower labour costs than the public transportation industry generally. Effectiveness would improve because taxi operations can typically operate with shorter advance request and en-route travel times and serve a greater number of cross-boundary trips, the cost of which are reflected in Summary Table 4. As well, savings could be used to improve the quality of existing publicly operated specialized service. Over time, accessible taxis can be brought into the system.

All this assumes, however, that the use of subsidized taxi services as a component of specialized transit could be successfully implemented without impeding the efficiency of commercial operators and that commercial operators would be willing to participate. Experience in the United States indicates that neither assumption can be taken for granted. Some cities have contracted with a single operator only to find that in the absence of competition price and service are no better than publicly operated public transit. Where competition among taxi operators has been retained (Phoenix, for example), true efficiencies have been achieved. And while some cities report positive experiences with private partnerships, others (such as South Portland, Maine) have been unable to attract the taxi industry to participate at all.

For these reasons, this element of the strategy must be implemented carefully and cannot be expected to develop quickly. It should be viewed as a medium to longer term initiative -- one that is well worthwhile but one that would take shape gradually.

Inter-Jurisdictional Service -- The GO Transit Situation. The analysis presented in the main report spans a wide spectrum of options for providing commuter services in the GO Transit region that disabled persons can use. As in the urban case, full access to the fixed-route modes (commuter rail and inter-jurisdictional buses) was found to offer the prospect of little additional mobility and high cost. The analysis also revealed technical barriers associated with extended dwell times at rail stations[12].

The inter-jurisdictional strategy outlined in Summary Table 4 features three components. The first would accelerate the implementation of improvements to existing GO Transit stations, bus stop environments and vehicles in order to improve the effectiveness of the system for ambulatory disabled persons. These improvements would benefit fully 59,000 disabled residents of the GO Transit service area and would likely aid a great many others who, though technically not classified as disabled, endure minor arthritis and other conditions that make the existing system less than fully effective.

The second initiative involves the introduction of specialized, door-to-door service for inter-jurisdictional journeys in the GO Region. The service envisaged here would be contracted by GO Transit to commercial taxi operators and coordinated by a central dispatching function operated either by GO Transit or contracted to a commercial firm.

It is important to note that the service would not be tendered to a single taxi firm but rather be open to several firms. This approach retains an element of competition among providers so as to ensure the lowest possible fares; competition would also helps maintain high service quality; as well, the use of several firms would allow the dispatcher to optimize productivity and thus diminish costs by drawing on many vehicles and thereby minimize deadheading.

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[12] See also, James F. Hickling Management Consultants Ltd. **Accessible Commuter Rail For The Disabled: An Evaluation and Decision-Making Framework**, September, 1985.

The approach would also involve financial assistance to commercial taxi operators for the purchase of accessible vehicles in sufficient quantities to handle the demand among wheelchair users. The approach envisaged in Summary Table 4 foresees half the cost of these vehicles being covered by the provincial government and half shared between municipalities and the commercial operator.

Finally, the strategy addresses the question of access to fixed-route services operated by GO Transit. In developing the strategy, the possibility of making the commuter rail service and the commuter bus service accessible to wheelchair users (and those with similar functional disabilities) was explored in terms of effectiveness and cost. On both counts, these options scored very poorly, with forecasts indicating low trip making, high capital and operating outlays and cost-per-trip often in the hundreds of dollars.

One option, however, does suggest a possible role for accessible fixed-route service, though more research and development is needed. The option is called On-Call Accessible Bus Service, or OCAB. Under this initiative, a GO Transit bus route would operate an accessible bus if requested to do so by a disabled person. If the disabled person demonstrates that the vehicle would be used regularly, then the bus could become a permanent feature of the route. In this way, the OCAB system would activate the need for accessible buses only in the event that demand is revealed, thereby diminishing financial risk.

Accessible fixed-route service in a line-haul, long distance commuter environment is found to be more effective than in an urban network environment due to the absence of transfer and other network requirements that increase the number of accessible vehicles needed. As well, long-distance, line-haul service could more easily compete with door-to-door service when trip lengths are very long. Inter-regional door-to-door trips in the GO Transit region would cost, on average, some $30.00 per trip (including fares) -- far higher than the $16.00 associated with municipal specialized service. Longer than average inter-regional trips would cost even more. A taxi journey from Barrie to Toronto, for example, would likely exceed the estimated $54.00 per-trip cost of OCAB. It is in this long-distance environment where, at first blush, it seems that OGAB could prove cost-effective.

On the other hand, if door-to-door feeder service were required at either end of the line-haul journey, any relative cost-effectiveness advantages of OCAB could quickly evaporate. The OCAB concept should thus be viewed as a possible subject for further research and development, not as a ready-to-go element of the strategy presented here.

Intercity Services. This part of the strategy involves the province in providing financial incentives to the intercity bus industry to equip their vehicles with lifts. As the public transport mode covering the largest intercity network, this approach is found to be potentially more effective than accessible rail services or other forms of accessible bus transportation (such as station-based lifts). At hundreds of dollars per-trip, door-to-door services over long intercity distances are found to be cost ineffective.

Air services (including both airport and airline aspects) are found to be improving steadily but in need of further encouragement. From the provincial standpoint, travel to and from the airport appears to be the most relevant problem. It would be dealt with most effectively through the urban and rural programs that foster door-to-door service.

Beyond this, an active provincial liaison with the federal government and with airlines is appropriate in order to stay abreast of -- and influence -- their efforts to enhance airport (including airport parking) architectural improvements and airline procedures regarding disabled passengers.

Here again, it is noteworthy that initiatives in the personal mobility section of the strategy, designed to extend the availability of private cars, would be of particular significance. Given a choice, most disabled persons choose the car over the bus or the plane and many cannot afford to travel by air.

STRATEGIC POLICY AND THE PLANNING PROCESS

A number of general conclusions emerge from the strategy summarized in this report. First, while a large number of disabled persons gain substantial benefits from provincial transport policies, they represent a small proportion of the disabled population generally. This results from the fact that not all disabled persons have disabilities that result in transportation problems. As well, most disabled persons have access to private cars and elect not to avail themselves of publicly sponsored transport programs. Moreover, among those who do use such programs, many regard them as a "back-up" to the auto and thus do not use them on a regular basis.

At present, about five percent of the disabled population gain from provincially sponsored transport programs at a provincial cost of about $14 million annually (in 1986). Under the broader eligibility strategy presented here, this proportion could rise to about 25 percent while the provincial budgetary commitment could eventually increase four-fold. Among these, about 13 percent are mildly or moderately disabled persons who would gain from design improvements to existing fixed-route transit services. And about 12 percent are severely disabled individuals. Among these, just under eight percent are urban residents who would gain from expanded specialized services; almost three percent are rural residents; and between one and two percent are persons who would gain from greater access to private autos.

As discussed earlier, the strategy presented here is just that, a strategy. It provides broad direction with regard to transport modes, methods of subsidy, private sector participation, expected costs and expected benefits. It does not indicate when a particular initiative should be implemented nor does it prescribe the exact scope of a given initiative or indicate in what combination various actions should be taken. Indeed, it is clear from Summary Table 4 that implementing all the initiatives, in their full scope, simultaneously could require a four-fold increase in the provincial transport budget for disabled persons. Although this report does not recommend against such an increase, the point here is that the strategy presented in Summary Table 4 does not confine the province to any one approach.

The specific approaches taken will depend upon the budgetary resources available and the priorities of decision makers. In other words, the decisions to be made are planning and programming decisions that should follow the adoption of a strategic policy. The strategy presented here is intended to provide sufficient information to guide the process of shaping priorities in consultation with providers and user groups and to steer the adoption of a rational and effective plan for the decade ahead.